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view, namely to determine the influence of Table Mountain on the direction of the plumb-line. He next relates his progress to Klyp Fonteyn, where he arrived on the 24th of March, 1838, and describes the operations resorted to for erecting the sector at that place. He then enters into the details of observations made at different stations, and especially with comparative observations at the summit and foot of the mountain of Pequet Berg. The instrument was lastly conveyed back to Cape Town, and again examined, and the observations made with it repeated. The reduction of the observations occupies the remainder of the paper; and in conclusion, the author remarks, that although these labours have not altogether cleared up the anomaly of La Caille's arc, yet they show that great credit is due to that distinguished astronomer, who with imperfect means, and at the period in which he lived, arrived at a result, derived from sixteen stars, almost identical with that from 1139 observations on forty stars, made with a celebrated and powerful instrument.

December 19, 1839.

MAJOR SABINE, R.A., V.P., in the Chair.

Henry Drummond, Esq., was duly elected a Fellow of the Society.

A paper was read, entitled, "An account of experiments made with the view of ascertaining the possibility of obtaining a spark before the circuit of the Voltaic Battery is completed." By J. P. Gassiot, Esq.

The author of this paper adverts to the fact, of a spark invariably appearing when the circuit of the Voltaic Battery is completed; an effect which Dr. Faraday has shown can be easily produced, even with a single series. He then refers to the experiments of Mr. Children, Sir Humphry Davy, and Professor Daniell, recorded in the Philosophical Transactions; in which experiments, when more powerful and extended series were used, the spark was obtained before contact took place.

In order to ascertain, not only the fact of a spark being obtained, but also the distance through which it may be passed, the author had an instrument prepared, which he denominates a *Micrometer Electrometer*, and by which an appreciable space of one five-thousandth of an inch could be measured with great accuracy. He describes this instrument; and relates several experiments which he made with a view to test the correctness of its action. He first prepared 160, and then 320 series of the constant battery, in half-pint porcelain cells, excited with solutions of sulphate of copper and muriate of soda; but although the effects, after the contact had been completed, were exceedingly brilliant, not the slightest spark could be obtained. He was equally unsuccessful with a water battery of 150 series, each series being placed in a quart glass vessel;

and also with a water battery belonging to Professor Daniell, consisting of 1020 series; but when a Leyden battery of nine jars was introduced into the circuit of the latter, sparks passed to the extent, in one instance, of six five-thousandths of an inch.

The author mentions his having been present at the experiment of Professor Daniell, on the 16th of February, 1839, when that gentleman had 70 series of his large constant battery in action; and having been witness of the powerful effects obtained by this apparatus, he was induced to prepare 100 series of precisely the same dimensions, and similarly excited: but although this powerful apparatus was used under every advantage, and the other effects produced were in every respect in accordance with the extent of the elements employed, still no spark could be obtained until the circuit was completed; *even a single fold* of a silk handkerchief, or a piece of dry tissue paper, was sufficient to insulate the power of a battery, which, after the circuit had been once completed, fused titanium, and heated 16 feet 4 inches of No. 20 platinum wire.

The author then describes a series of experiments made with induced currents. Twelve hundred and twenty iron wires, each insulated by resin, were bent into the form of a horse-shoe. A primary wire of 115 feet and a secondary of 2268 feet, were wound round the iron wires. With this arrangement he obtained a direct spark (through the secondary current), sufficient to pierce paper, to charge a Leyden jar, &c. Several forms of apparatus employed by the author are next described, and also a series of 10,000 of Jacobone's piles. With this arrangement he charged a Leyden battery to a considerable degree of intensity, and obtained direct sparks of three-fiftieths of an inch in length. He ultimately succeeded in obtaining chemical decompositions of a solution of iodine and potassium, the iodine appearing at the end composed of the black oxide of manganese.

The Society then adjourned over the Christmas Vacation, to meet again on the 9th of January, 1840.

January 9, 1840.

JOHN WILLIAM LUBBOCK, Esq., V.P. and Treasurer, in the Chair.

John Augustus Lloyd, Esq., who, at the last Anniversary, had ceased to be a Fellow, from the non-payment of his annual contribution, was at this meeting re-admitted by ballot into the Society, agreeably to the provision of the Statutes.

James Whatman, Jun., Esq., M.A., was balloted for, and duly elected into the Society.